

IN THE U.S. PATENT AND TRADEMARK OFFICE

In re application of

Martin WYETH

Conf.

Application No. NEW NON-PROVISIONAL

Group

Filed March 15, 2004

Examiner

BALL FEEDER

CLAIM TO PRIORITY

Assistant Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

March 15, 2004

Sir:

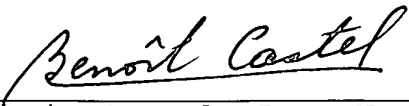
Applicant(s) herewith claim(s) the benefit of the priority filing date of the following application(s) for the above-entitled U.S. application under the provisions of 35 U.S.C. § 119 and 37 C.F.R. § 1.55:

<u>Country</u>	<u>Application No.</u>	<u>Filed</u>
GREAT BRITAIN	0307162.8	March 28, 2003

Certified copy(ies) of the above-noted application(s) is(are) attached hereto.

Respectfully submitted,

YOUNG & THOMPSON



Benoit Castel, Reg. No. 35,041
745 South 23rd Street
Arlington, VA 22202
Telephone (703) 521-2297
Telefax (703) 685-0573
703) 979-4709

BC/ia

Attachment(s): 1 Certified Copy(ies)

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Concept House
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Newport
South Wales
NP10 8QQ

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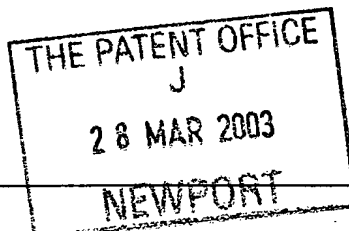
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MRH.P04760GB

1. Your reference

2. Patent application number

(The Patent Office will fill in this part)

0307162.8

3. Full name, address and postcode of the or of each applicant (*underline all surnames*)

Martin Wyeth
Unit 5 Woodside
South Marston Park
Swindon
SN3 4WA

Patents ADP number (*if you know it*)

If the applicant is a corporate body, give the country/state of its incorporation

8598682001

4. Title of the invention

BALL FEEDER

5. Name of your agent (*if you have one*)

"Address for service" in the United Kingdom to which all correspondence should be sent (*including the postcode*)

Marks & Clerk
27 Imperial Square
Cheltenham
GL50 1RQ

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18014 ✓

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (*if you know it*) the or each application number

Country

Priority application number
(*if you know it*)

Date of filing
(*day / month / year*)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(*day / month / year*)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (*Answer 'Yes' if:*

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- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant, or
 - c) any named applicant is a corporate body.
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Patents Form 1/77

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Continuation sheets of this form

Description	6
Claim(s)	2
Abstract	1
Drawing(s)	2

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Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

1

Request for substantive examination (*Patents Form 10/77*)

Any other documents
(please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

Marked Clerk

Date

Marks & Clerk 27th March 2003

12. Name and daytime telephone number of person to contact in the United Kingdom

Mr M R Higgins
01242 524520

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Notes

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BALL FEEDER

This invention relates to a ball feeder and more particularly, but not
5 exclusively, to a feeder for feeding balls one at a time to a golf tee.

It is known to provide a golf driving range with a mechanism for
automatically feeding golf balls to a golf tee. Known mechanisms have a ball engine
which receives balls from a hopper and which delivers the balls one at a time to the
10 tee. The problem with such a mechanism is that the balls wedge or bridge in the
hopper and it is necessary to provide a vibrating or prodding mechanism to release
them. This can be relatively expensive.

The present invention seeks to provide a ball feeder which is relatively cheap
15 to manufacture.

According to the invention there is provided a ball feeder comprising a funnel
having a base, opposing side walls, a ball inlet end and a ball outlet end, the base
being in use inclined to define a ramp extending downwards from the inlet end to the
20 outlet end and the side walls diverging in width from the inlet end to the outlet end.

Preferably, the base is in use inclined by at least 4° to the horizontal.

Preferably, the ball feeder also comprises a scoop for receiving a single transverse row of balls at the outlet end of the funnel and means for raising the scoop into an elevated position in which it defines a second ramp extending transversely of the first mentioned ramp and in which it can release the balls one at a time. In this case, the raising means may also raise and lower a tee.

The invention also resides in apparatus for automatically feeding golf balls one at a time to a tee, comprising means for detecting when a player has hit a golf ball off the tee and a ball feeder as claimed in anyone of the preceding claims for feeding a golf ball to the tee in response to the detector means.

The invention will now be more particularly described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is a perspective fragmentary view of one embodiment of a ball feeder according to the present invention,

Figure 2 is a perspective view on an enlarged scale of a scoop and golf ball feeding mechanism of the ball feeder with parts omitted for clarity, and

Figure 3 is a side view of the scoop and golf ball feeding mechanism shown in Figure 2.

Referring to the drawings, there is shown therein a ball feeder for feeding balls one at a time to a golf tee at a golf driving range.

The ball feeder comprises a funnel in the form of a tray 10 having a base 11, 5 opposing side walls 12 and 13, a ball inlet end 14 and a ball outlet end 15. An open topped compartment 16 is provided at the outlet end 15 of the funnel and this compartment houses a scoop 17 and a mechanism 18 for raising and lowering the scoop and for feeding balls to a tee.

10 The base 11 of the funnel is inclined to define a ramp extending downwards from the inlet end 14 to the outlet end 15 in order that balls fed into the tray 10 at the inlet end 14 roll down the tray to the outlet end 15. The base 11 is inclined by at least 4° to the horizontal in order to ensure that motion is imparted to the balls.

15 The side wall 12 of the tray 10 is angled outwards from the inlet end to the outlet end so that it diverges relative to the side wall 13 in a downwards direction. This ensures that no balls wedge or bridge during their movement along the base 11 of the tray 10.

20 The balls roll onto the scoop 17 to form a single transverse row of balls and the scoop 17 is raised by the mechanism 18 to define a second ramp extending transversely of the first mentioned ramp to release the balls one at a time. The ball

receiving surface of the scoop 17 is inclined in the direction in which the balls travel down the tray 10 at the same or at a similar angle to the base 11 of the tray 10 and is also inclined in a transverse direction to encourage balls to roll one at a time onto a third fixed ramp 20 when the scoop 17 is in a raised position.

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The mechanism 18 comprises a carriage 21 which can be raised and lowered along a pair of spaced guide rods 22 by a threaded spindle 23 rotated by a motor 24 connected to the spindle by a belt drive 25. The scoop 17 is mounted at the free end of each of a pair of arms 26 pivoted at 27. The arms 26 are spring urged upwardly.

10 An arm 28 on the carriage 21 engages a part 29 of the support structure for the scoop 17 to lower the scoop 17 with the carriage 21. As the carriage 21 moves upwards the scoop 17 follows it until the scoop 17 reaches its raised position.

The carriage 21 is connected via torsion springs 30 and a pair of torsion arms 31 to a tee (not shown) housed within a tee shield 19. The tee is urged downwards within the tee shield 19 and is raised as the carriage 21 is raised. During upwards movement of the carriage 21, an annular shoulder 33 on the tee shield 19 engages a support surface 34 forming part of the housing for the mechanism 18 thus preventing further upward movement of the tee shield so that the tee is driven upwards to project

15 31 to a tee (not shown) housed within a tee shield 19. The tee is urged downwards within the tee shield 19 and is raised as the carriage 21 is raised. During upwards movement of the carriage 21, an annular shoulder 33 on the tee shield 19 engages a support surface 34 forming part of the housing for the mechanism 18 thus preventing further upward movement of the tee shield so that the tee is driven upwards to project

20 from the top of the tee shield 19. The torsion springs 30 provide for downwards movement of the tee relative to the carriage should someone tread on the tee.

A pin 35 projects rearwards from the carriage and makes contact with a lever mechanism 36 as the carriage is raised to lower an injector 37 along a further pair of upstanding guide rods 38.

5 In operation golf balls are fed into the inlet end 14 of the tray 10. They roll down the inclined base 11 of the tray and form a single transverse row of balls on the scoop 17 when the scoop is in a lowered position. As the carriage 21 is raised by the motor 24, the tee is also raised and the injector 37 is lowered. The scoop 17 is brought upwards to the level of the fixed ramp 20 and the injector 37 is brought down
10 to the level of the fixed ramp 20 so that the injector 37 can receive a ball from the fixed ramp 20. The tee is now in a raised position so that a ball on the tee can be hit. The carriage 21 is then lowered thus lowering the scoop 17 so that it can receive another ball from the tray 10. The tee moves downwards and the injector 37 moves upwards until the top of the tee shield 19 and the injector 37 are level with one
15 another. The ball on the injector 37 then rolls onto the tee shield in readiness for the next raising movement of the carriage 21 when the tee will collect the ball as it projects upwards from the top of the tee shield 31.

The ball feeder forms a part of apparatus for automatically feeding golf balls
20 one at a time to a tee. This apparatus includes a ball feeder as described above and an arrangement for detecting when a player has hit a golf ball off the tee. One example of a detecting arrangement is disclosed in our co-pending Patent Application

No. of even date. The mechanism 17 is operated in response to the detecting arrangement to feed a golf ball to the tee each time a ball is hit off the tee by a player.

5 The embodiment described above is given by way of example only and various modifications will be apparent to persons skilled in the art without departing from the scope of the invention as defined by the appended claims.

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CLAIMS

1. A ball feeder comprising a funnel having a base and opposing side walls, the base having a ball inlet end and a ball outlet end and being in use inclined to define
5 a ramp extending downwards from the inlet end to the outlet end and the side walls diverging in width from the inlet end to the outlet end.
2. A ball feeder as claimed in claim 1, wherein the base is in use inclined by at least 4° to the horizontal.
- 10 3. A ball feeder as claimed in claim 1 or claim 2, further comprising a scoop for receiving a single transverse row of balls at the outlet end of the tray and means for raising the scoop into an elevated position in which it defines a second ramp extending transversely of the first mentioned ramp and in which it can to release the
15 balls one at a time.
4. A ball feeder as claimed in claim 3, wherein the scoop raising means also raises and lowers a tee.
- 20 5. A ball feeder as claimed in claim 4, wherein the scoop raising means comprises a carriage for raising and lowering the scoop and the tee and power operated means for raising and lowering the carriage.

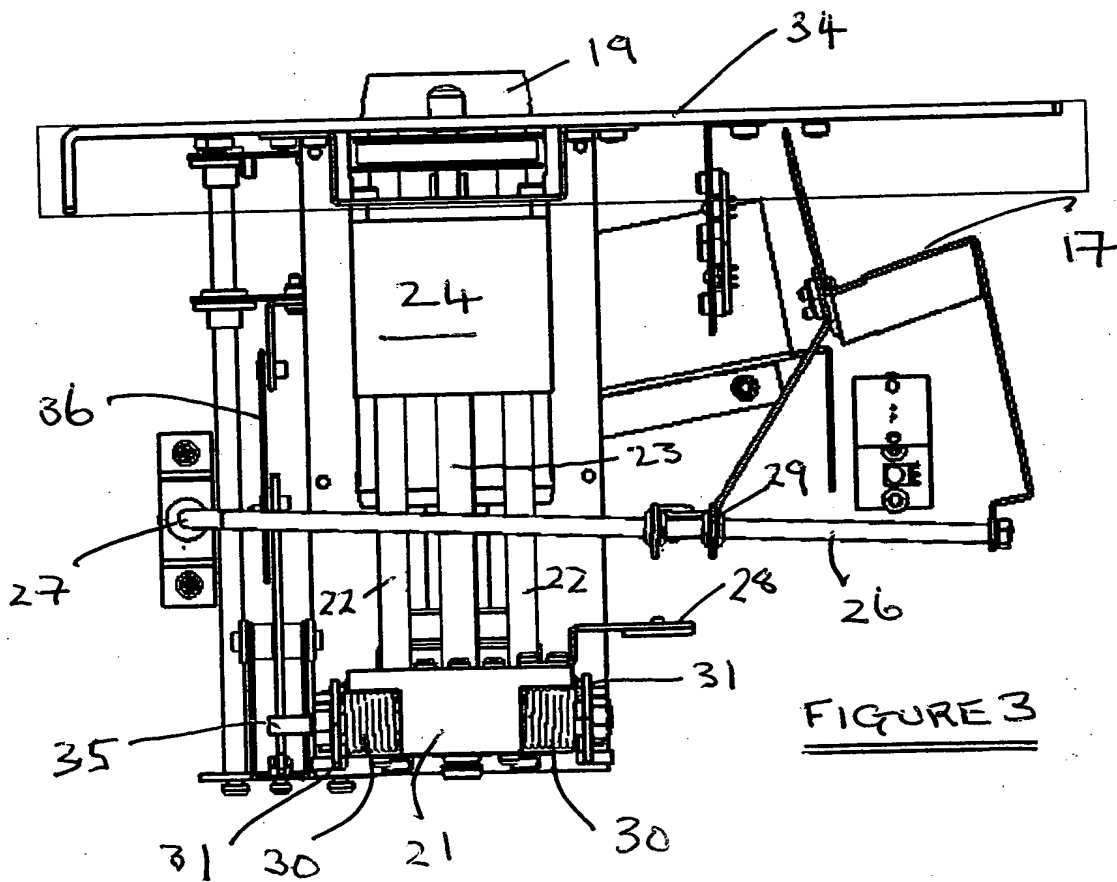
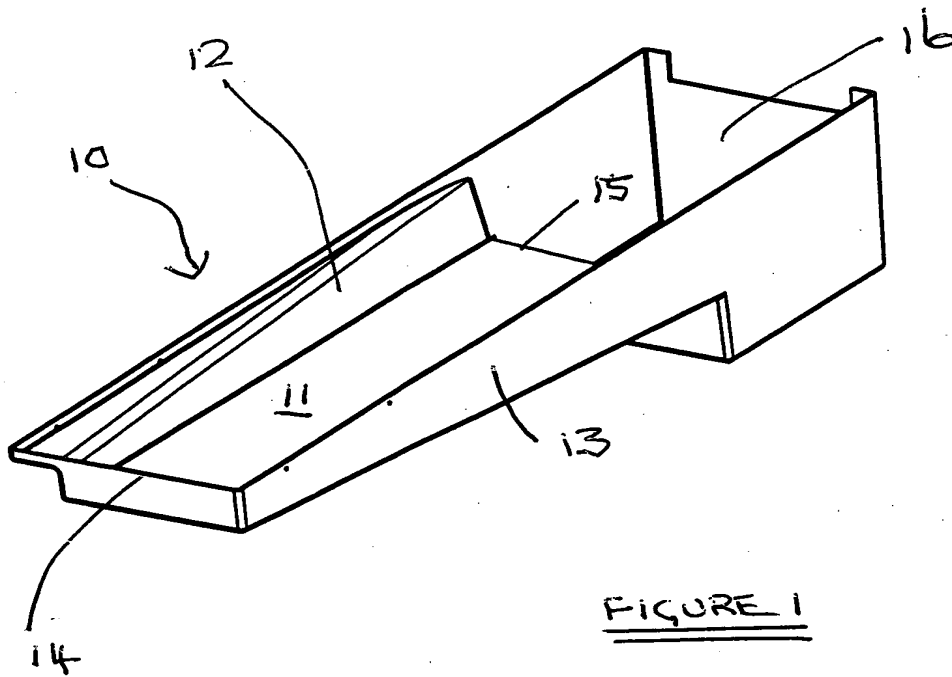
6. A ball feeder as claimed in claim 5, further comprising an injector movable by the carriage to collect a ball raised by the scoop when the tee is in a raised condition and to deliver a ball to a tee shield when the tee is in a lowered condition.
- 5 7. A ball feeder substantially as hereinbefore described with reference to the accompanying drawings.
8. Apparatus for automatically feeding golf balls one at a time to a tee, comprising means for detecting when a player has hit a golf ball off the tee and a ball
- 10 feeder as claimed in any one of the preceding claims for feeding a golf ball to the tee in response to the detector means.

ABSTRACTBALL FEEDER

A ball feeder comprises a funnel 10 having a base 11, opposing side walls 12
5 and 13, a ball inlet end 14 and a ball outlet end 15. The base 11 is inclined to define
a ramp extending downwards from the inlet end to the outlet end and the side walls
diverge in width from the inlet end to the outlet end. Preferably, the ball feeder also
comprises a scoop 17 (Figure 2) for receiving a single transverse row of balls at the
outlet end of the funnel and means 18 (Figure 2) for raising the scoop into an elevated
10 position in which it defines a second ramp extending transversely of the first
mentioned ramp and in which it can release the balls one at a time. The raising
means may also raise and lower a tee.

(Refer to Figure 1)

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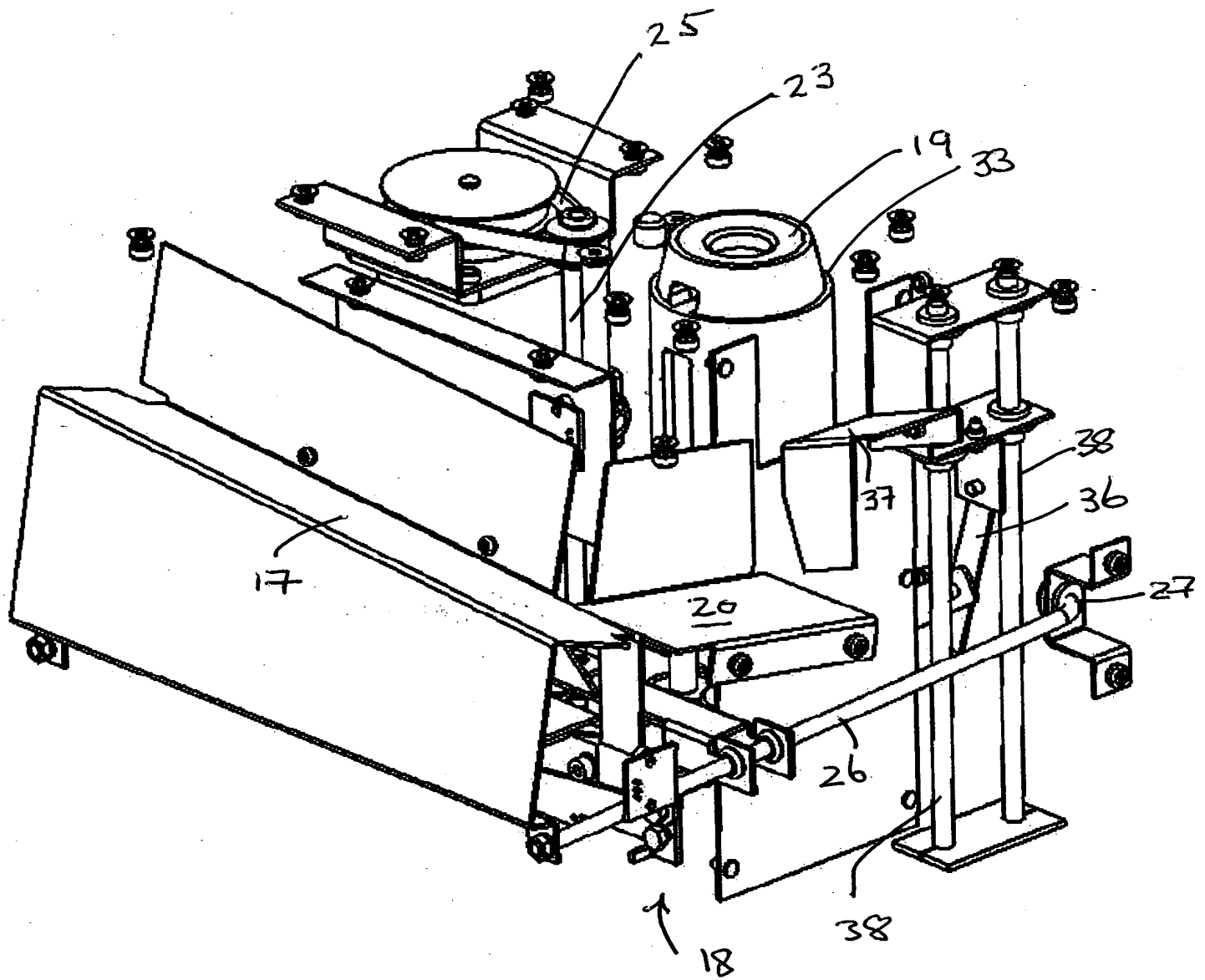


FIGURE 2

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